

# PowerClass

(Written Report)

All your school matters in one place

**Project Members:**

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Tan Yu Bin (3a3)

# 1. Introduction

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## Description of Idea

PowerClass is a unified platform which compiles information from ISP, Google Classroom and SLS, in order to increase students' awareness of their homework and school matters.

## Rationale / Description of Issue (Inconvenience & Confusion)

Hwa Chong Institution has come up with many portals over the years to provide students with more services and make it more convenient for students to do things like check exam results or bid for a sabbatical in school. Contrary to what the school IT Department believes, students do not find it convenient to access the different school portals, and even find it troublesome and inconvenient due to the cluttered nature and outdated design of the portals.

## Description of Solution

Instead of straining their eyes to find 'CIP & Service Learning' in 11px font among tens of other tabs, students can visit PowerClass and have this feature and many more brought to them through a website with extensive functionality and an intuitive UI designed with their convenience in mind.

## Target Audience + Project Scope

PowerClass is targeted at HCI students, and aims to collate all online homework and school matters into a single unified platform.

# 2. Literature Review

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## Existing Case Studies

There are existing portals that act as learning management systems.

### Case Study 1 - Edmodo

- Teachers can post quizzes, assignments and files
- Integration with Google and Office 365 accounts
  - Advantages:
    - Students can sign in through their Google or Microsoft account, increasing convenience of access.
  - Drawbacks:
    - Courses cannot be posted – teachers must manually post a link to the course on another website.

### Case Study 2 – Google Classroom

- Teachers can post quizzes, assignments and files
- Each class has a Google Drive folder for class materials.
  - Advantages:
    - Drive integration makes all files easy to access.
    - Tied to students' Google account.
  - Disadvantages:
    - Courses cannot be posted – teachers must manually post a link to the course on another website.

### Case Study 3 – MCOonline

- Teachers can post quizzes, assignments and files
- Teachers can create interactive lessons and learning materials.
  - Advantages:
    - Assignments shown on login, making it easier to remember homework
  - Disadvantages:
    - Unintuitive, complex UI makes it very inconvenient to access items

# 3. Methodology

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## Needs Analysis

- Conducted survey among students
- 70% of students felt there were too many portals being used in school
- Of those, 90% felt that the portals were filled with too much information
- They felt that this made it very inconvenient to search for information
- Conclusion:  
Overwhelming majority of respondents found it inconvenient to access information due to large number of portals and difficulty in locating specific links.
- When presented with PowerClass as a solution, almost all respondents said they would use PowerClass, should it become fully functional.

## Programming Languages and Platforms

- Node.js
- MongoDB
- HTML, CSS, JavaScript
- IDEs: Visual Studio Code, Sublime Text

## Member Roles

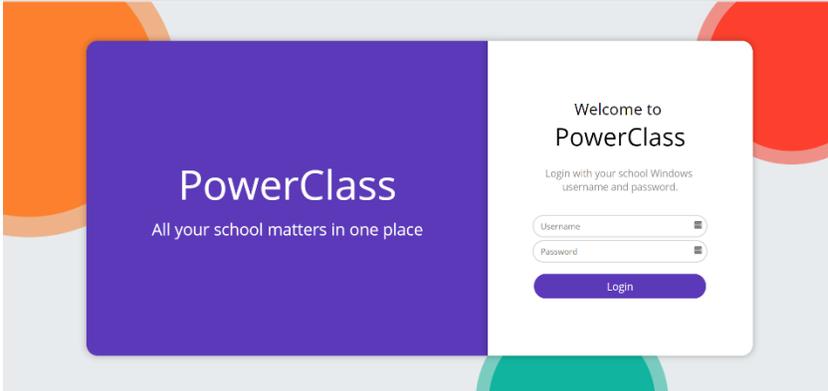
- Jonathan Koh: **Frontend programmer**
- Ho Wing Yip: **Backend programmer, frontend programmer, designer**
- Tan Yu Bin: **Frontend programmer**

## PowerClass Timeline

<b>March</b>	Heroku Deployment set up Google Classroom API, data collection from ISP tested and working
<b>April</b>	Portal UI #1 completed
<b>May</b>	Portal UI #2 completed
<b>June</b>	Google Classroom frontend completed SLS data collection tested and working ISP frontend completed Portal UI #3 completed
<b>July</b>	Portal UI #4 (current) completed SLS frontend completed Accounts system completed
<b>6<sup>th</sup> August</b>	Report submitted

# 4. Outcomes, Analysis & Discussions

## Features

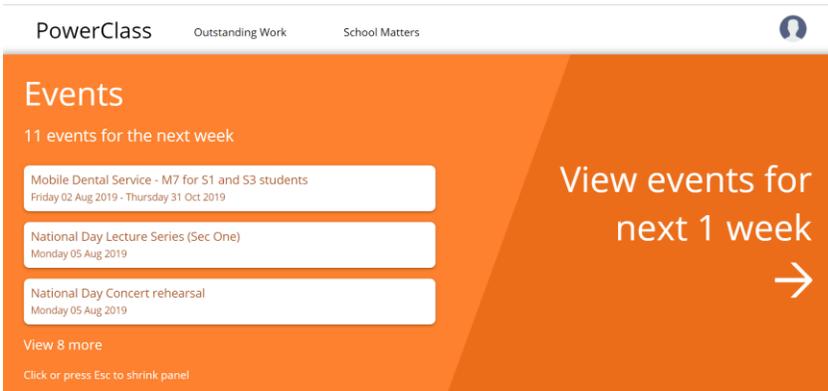


Users login with school Windows credentials

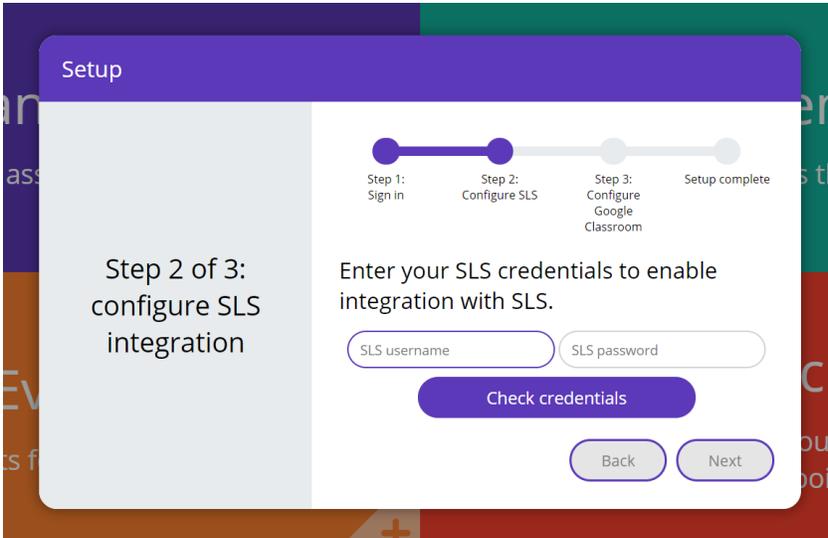


Dashboard provides commonly used features at a glance

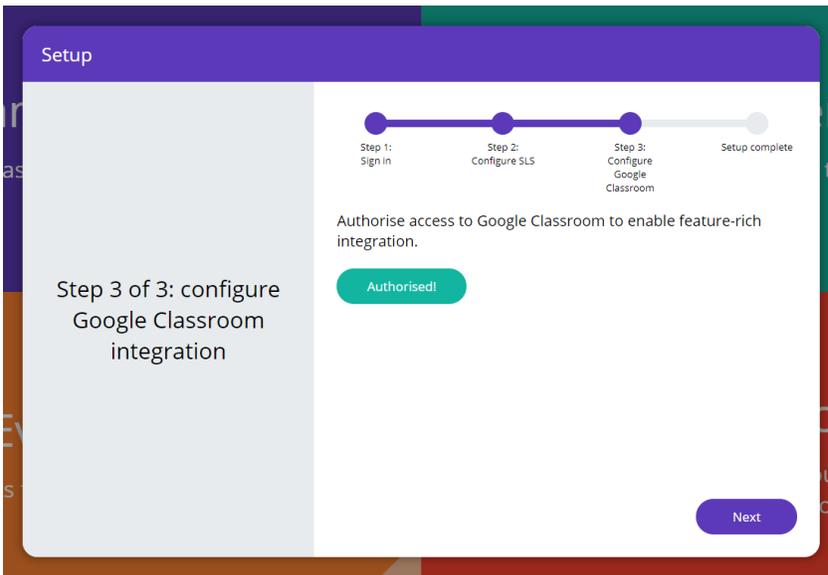
- Outstanding Work
- Announcements
- Events
- CIP hours, demerit points



Panels expand to reveal more information when clicked



**SLS integration for viewing SLS assignments**



**Google Classroom integration for viewing Google Classroom coursework**

PowerClass Outstanding Work School Matters

**Announcements**

- CIP
- Discipline
- Events
- Exams
- Particulars
- Project Work

**2019 402 Prelim Exam Timetable**  
 Additional details: 2019 402 Prelim Exam Timetable  
 Created by: BALASUNDARAM SELVAKUMAR (Mr)  
 Date: 23 Jul 19  
 Attached file: [Click here to download](#)

**2019 Singapore-Cambridge GCE O LEVEL Examinations Rules and Regulations for School Candidates**  
 Additional details: None  
 Created by: CHEONG SEW WA (Mdm)  
 Date: 18 Jul 19  
 Attached file: [Click here to download](#)

For details on claim benefits and procedures and/or to download the claim form for Student's Accident Protection Insurance and Travel Insurance, please visit our website (under "Admission & Studies" -> "Financial Information" -> "Student Insurance Matter"). Please note that ORIGINAL supporting documents (eg invoices/receipts) are required to be submitted together with the completed claim forms.

Additional details: None  
 Created by: CHU CHEW LING (Miss)

School matters portal provides convenient access to important school matters

- Announcements
- CIP records
- Discipline records
- Events
- Exam results
- Personal particulars
- Project work

PowerClass Outstanding Work School Matters

**Google Classroom**

2019 3A3 Computing (TCO)

2019 S3 Computing

**Arduino and IoT Final Project**

This lesson introduces students to transmission and execute a practical project based on arduino and IoT. Students are to demonstrate and apply what they have been taught throughout their arduino class to solve a real world problem.

Please refer to the "Arduino\_LSP2.pdf" project brief for details on requirements, submission and assessment.

Do also take a note on the notes attached for a guide on how others have used arduino and IoT to create an interesting and meaningful project. Submission is to be done in a form of video recording with an audible narration. Looking forward to your submission!

Top 10 Arduino IoT projects 2019 ...  
 Youtube Video

Top 10 Arduino Projects For Begin...  
 Youtube Video

10 Arduino Projects with DIY Step...  
 Youtube Video

Top 10 Arduino-Sensors with Proj...  
 Youtube Video

Arduino\_LSP2.pdf  
 Google Drive

Arduino Automated Car Parking S...  
<https://www.instructables.com/15AAV...>

**SLS**

No SLS assignments.

Outstanding Work page collates assignments from Google Classroom and SLS

# 5. Implications and Recommendations

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## Limitations

- Only the most commonly used features are displayed to ensure UI remains intuitive
- Due to security issues, PowerClass cannot write data to school servers and hence does not allow students to edit data
- PowerClass' design breaks on mobile devices

## Areas for Improvement

- **Design & Responsiveness**

We were not able to dedicate enough time to prototyping UI and UX, meaning PowerClass' design could have been improved. PowerClass could also have been designed responsively to cater to mobile devices.

## Possible Extensions

- **Integration with other portals** e.g. iEMB, i-Comp, etc.
- **Mobile site** – responsive design, intuitive design features dedicated to mobile users

## **Evaluation of Effectiveness – School Matters**

- Included 7 most commonly used portals
- Extensive functionality – e.g. downloading exam reports through exam results portal
- However, some functionality left out (needs analysis not conducted for individual functions) – e.g. can't view Project Evaluation results through Project Work portal
- Should have conducted needs analysis on what functionality to include

## **Evaluation of Effectiveness – Outstanding Work Collation**

- Integrated most commonly used homework portals – Google Classroom, SLS
- Google Classroom functionality replicated well - can view all assignments from all classes, along with their materials (and even thumbnails). Users are also linked to original assignment on Google Classroom.
- SLS functionality mostly (but not completely) provided due to technical constraints. Could also not provide actual links to assignments due to SLS having no API.

## **Evaluation of Effectiveness – Overall**

- External services mostly well-integrated
- Should try to gather students' precise needs for functionality to improve usefulness of PowerClass

# 6. Conclusion

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## Learning Points

- **Communication** could be greatly improved
  - Better awareness of each other's progress
- **Time management & coordination** should have been better
  - Project had to be rushed several times
- **Work delegation** not adhered to – backend dev had to take up role of frontend dev + designer
  - Had to do much more work to make up for other members doing much less
  - Members must be more **responsible** and **dedicated** in order to avoid this

## Reflections

Jonathan

This project has helped me gain a much deeper understanding of other server-side languages like NodeJS and the use of programs such as MongoDB in creating web applications. I learnt the importance of keeping one another updated on progress and how to coordinate between team members much more effectively. As the leader of the project, it has not been easy, delegating time between project work, academics, council and other commitments. I do have to thank my groupmates for helping me carry some of the workload during the periods where I had many events going on at once. All in all, I have learnt a lot from this project, especially with regards to the delegation of work and time management.

## Wing Yip

This project has been a bittersweet experience.

On one hand, I got to experience several new things through backend development, including gaining insight into the internals of Node.js, learning important information about how servers and databases work, and gaining valuable experience in server-side programming. However, the administrative side of things has been quite the bumpy ride for PowerClass. By June, I had completed about 70% of the backend of PowerClass, while the pages implementing functionality on the frontend were nowhere to be found. We have been so far behind time that I, as a backend developer, have been forced to do several frontend pages such as the login page, dashboard, and 3 of the 7 school matters pages. I now know that we have a lot to improve on, especially in time management and delegation of work. We should also have communicated more so we would have been constantly aware of each other's progress. Despite the setbacks caused by these problems, I have learned much from them, and gained a great deal of technical expertise in the process. And for that, I am thankful.

## Yu Bin

This project was a new experience for me. Honestly, I really knew barely anything about web development since I had only been using C++ for competitive programming and some small games. My only other web development experience was from Build On Singapore. I have learnt much more about the three languages we used. Regarding the process though, I must say, we really did not plan this well. One of the major problems was that Wing Yip, our backend scraper had to double up as a designer as well since both Jonathan and I aren't exactly proficient at designing but I could help. This whole project was rushed, and Wing Yip had to do front end even though his job was supposed to be done at backend scraping. All in all, we could have had better time management and planning.

# 7. Bibliography

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Edmodo, date unknown. *Edmodo Integrations*. Retrieved from

<https://go.edmodo.com/integrations/>

Edmodo, 9 May 2018. *What Integrations are Available on Edmodo?* Retrieved from

<https://support.edmodo.com/hc/en-us/articles/205013194-What-Integrations-are-Available-on-Edmodo->

~ 1500 words, excluding references, charts, diagrams